

Cool, Comfy, Empty Buildings: An Inventory of Underutilized Commercial Buildings

We devote an increasing amount of land and energy to heating and cooling indoor spaces: commercial buildings in which we work and play...some of the time. While some buildings, like hospitals, lodging, and warehouses, churn around the clock, many are closed more often than they are open. Is there a better way to utilize these spaces? Which are the worst offenders?

New England
by the numbers:

275,000 buildings
3.7 billion square feet

75 hours per week
(average operating hours)

89% of floorspace heated
69% of floorspace cooled

What's the most underutilized space in New England?

Places of worship: shortest operating hours of all buildings, but fewer and smaller in New England.

Theatres, museums, concert halls, etc.

Principal Building Activity	Operating hr/wk	% of New England	% of Area	vs. US average	ft ² /person	Climate Controlled Floorspace (%)
Office	67	12%		-59%	21	83%
Admin./Prof.	63		62%	-54%	13	81%
Banks	40		2%	-76%	1	100%
Mixed-use	57		18%	-64%	4	97%
Religious Worship	31	2%		-81%	3	77%
Public Assembly	68	11%		-12%	19	69%
Entertainment/Culture	44		17%	-19%	3	86%
Social/Meeting	63		46%	+17%	9	67%
Library	66		12%	+73%	2	92%
Education	48	16%		-44%	28	88%
Elementary School	42		25%	-16%	7	77%
Multi-grade (K-12)	43		33%	-10%	9	85%
High School	48		24%	-17%	7	95%
Laboratory	145	2%		+73%	4	100%

3rd highest building type, but smaller on average than rest of US

Banks and mixed-use offices: closed more than they are open. Nearly 100% climate controlled

More libraries per capita than the rest of the US.

92% of library space heated and cooled - only open 39% of the week.

Devote the most space to education (only 3rd highest category for entire US), yet these buildings open < 1/3 of the time.

Nearly all high schools have heating and cooling, but are still only open 29% of the time.

More than its fair share of laboratories, which are universally climate controlled. They are well used, open almost 27 hours a day.

Data sourced for per capita space calculations derived from the Energy Information Administration (<https://www.eia.gov/consumption/>) Commercial Building Energy Consumption Survey (CBECS). Averages calculated here represent building-weighted means based on provided weighting factors. Salient primary building activity categories shown here were selected based on rank order w.r.t. operating hours and per capita floor space, with warehouse, storage and vacant categories omitted.